Benha University	**1st year students**	**Date : 29.12.2018**
Faculty of Science	**Applied inorganic chemistry (1)**	**Time: 1 hour**
Chemistry Department		**Code: Ch183**

Model Answer

Q1:

[1] (A) Cathode and anode, respectively.

At anode $2Cl^- \rightarrow Cl_2 + 2e^-$

At cathode $Na^+ + H_2O \rightarrow NaOH + H^+$

$2\,H^+ + 2e^- \rightarrow H_2$

[2] (D) Sodium chloride, sodium hypochlorite, and water.

$2NaOH + Cl_2 \rightarrow NaOCl$ (sodium hypochlorite)(explosive) $+ NaCl + H_2O$

[3] (C) Lead chamber

In this method nitrogen oxides were used as catalysts.

[4] (D) Contact

In this method vanadium pentoxide were used as catalysts.

[5] (A) Oleum

$SO_3 + H_2SO_4 \rightarrow H_2S_2O_7$ **(oleum or fuming sulphuric acid)**

[6] (B) silver

$2[Ag(NH_3)_2]NO_3 + RCHO + H_2O \rightarrow$ **2Ag (silver mirror)** $+ 4NH_3 + RCOOH + 2HNO_3$

[7] (C) Schweizer's reagent

$CuSO_4 + 2NH_4OH \rightarrow Cu(OH)_2 + (NH_4)_2SO_4$

$Cu(OH)_2 + 4\,NH_4OH \rightarrow [Cu(NH_3)_4(H_2O)_2](OH)_2 + 2H_2O$

[8] Heating ammonium carbamate gives **(B)** Organic fertilizers

$NH_2COONH_4 + heat \rightarrow NH_2CONH_2$ (urea) $+ H_2O$

[9] In the reaction of BCl_3 with NH_3 **(A)** BCl_3 is acid and NH_3 is a base

$BCl_3 + :NH_3 \rightarrow Cl_3B:NH_3$

Acceptor **Donor**

Not contain free lone pair of electron

Contain free lone pair of electron

[10] Solution of sodium carbonate is **(C)** basic

$$Na_2CO_3 + 2H_2O \longrightarrow 2NaOH \text{ (Strong base)} + H_2CO_3$$

[11] Knowing that oxidation no of Sn equals +2, Na_4 [Sn $(OH)_x$] **(C)** x=6

-6+2=-4

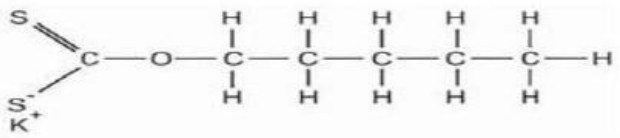
[12] (B) trichloroacetic acid > acetic acid in acidity

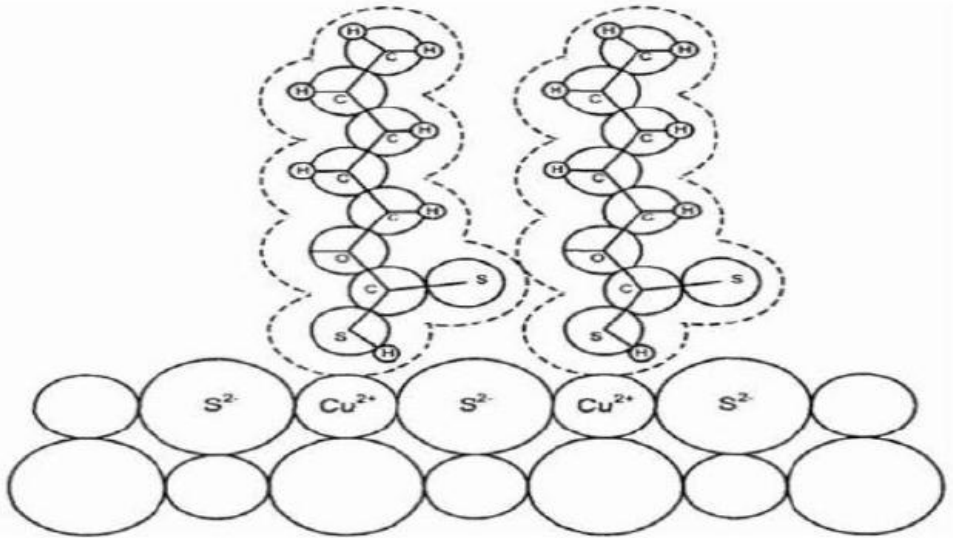
The small pKa value produces strong acid.

Q2:

Collectors

- **Substances that create the water repellent surfaces on copper minerals**
- **They have a polar (charged) end and non-polar(hydrocarbon) end**
- **They attach their polar (charged) end to the mineral surface (which is itself polar) leaving the non-polar hydrocarbon end extended outwards**
- **Example Potassium amyl xanthate**





Reactions occured at convertor | **Blister copper production process**

$2FeS + 3O_2 + SiO_2 \rightarrow 2FeO.SiO_2 + 2SO_2 + heat$

In molten matte — **Second molten slag**

$Cu_2S + O_2 \rightarrow 2Cu + SO_2 + heat$

In molten matte — **Copper blister**